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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,437	06/25/2003	Leping Huang	883.0007.U1(US)	6335

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HARRINGTON & SMITH, LLP
4 RESEARCH DRIVE
SHELTON, CT 06484-6212

EXAMINER	
NG, CHRISTINE Y	
ART UNIT	**PAPER NUMBER**
2663	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/606,437	HUANG, LEPING	
	Examiner	Art Unit	
	Christine Ng	2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 23-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *4,5,10,14,15 and 18* is/are allowed.

6)☒ Claim(s) *1-3,6,7,9,11-13,16,17,19,21,23-25 and 27* is/are rejected.

7)☒ Claim(s) *8,20,26 and 28-31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 11-13, 21 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,084,858 to Matthews et al in view of U.S. Patent No. 6,535,498 to Larsson et al.

Referring to claim 1, Matthews et al disclose in Figure 2A a method for routing data packets in a network, comprising:

Estimating a link bandwidth (used_bandwidth(e)) of at least one network node (source A). Refer to Column 8, line 65 to Column 9, line 8.

Calculating (Step 16) a connectivity metric ($Z_p(i)$) based on the estimated link bandwidth (used_bandwidth(e)). Refer to Column 4, lines 44-48 and Column 8, line 65 to Column 9, line 8.

Distributing (using a traversal value vector) information concerning the calculated connectivity metric ($Z_p(i)$), using a routing protocol packet (traversal value vector). "Each element of the vector corresponds to a current value for one of the metrics" and "each time a destination node is discovered, a traversal value vector is updated for each node" (Column 6, lines 6-16). The traversal value vector is a "routing protocol packet" in that its metrics are updated as it traverses through a path from a source to a

destination, so that the metrics can be used to determine the best path. Refer to Column 6, lines 35-39 and Column 7, lines 12-18.

Using the calculated connectivity metric ($Z_p(i)$), determining (Step 18) a route having a maximum link bandwidth and a minimum traffic load. After all paths are evaluated by the traversal value vectors, "the path which best fits the desired result for presentation is selected". Refer to Column 4, lines 50-54 and Column 7, lines 12-18 and 28-64.

Matthew et al do not disclose that the method is used in a wireless network.

Larsson et al disclose in Figure 4 a method of selecting optimal routes between nodes in a wireless Bluetooth ad-hoc piconet. "These routes may be more optimal than the original route in terms of fewer hops between the source node and the destination node or in terms of dropped packets and network delays along the original route" (Column 3, lines 47-50). A source node requests for an updated route to the destination node during a predetermined event. The predetermined event could be when the traffic throughput along the original route falls below a predetermined threshold value, when the number of intermediate nodes in the original route exceeds a predetermined number, or when the number of routes which flow through a node is above a predetermined threshold. Refer to Column 2, lines 22-45; Column 3, lines 19-50; and Column 4, line 62 to Column 5, line 32. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the method is used in a wireless network, the motivation being in order to facilitate routing in a wireless network by finding the most efficient route for data transmissions.

Referring to claims 2 and 12, Matthews et al do not specifically disclose that the estimating uses a model of a network medium access control MAC algorithm.

However, Matthews et al disclose that each packet has a source MAC address and a destination MAC address to designate the route of the packet. If a packet has multiple different paths, the best path is determined by factors such as bandwidth. Furthermore, the path of the packet is needed in order for the system to estimate the bandwidth required to route the packet to its destination. Refer to Column 1, lines 27-30 and Column 1, line 66 to Column 2, line 21. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the estimating uses a model of a network medium access control MAC algorithm, the motivation being that the MAC addresses specify the source and destination of the packet, so that the system can determine a path and estimate the bandwidth needed to route the packet.

Referring to claims 3 and 13, refer to the rejection of claim 1; and claims 2 and 12.

Referring to claim 11, Matthews et al disclose in Figure 3 a computer program embodied on a computer readable medium (memory 192) and comprising computer program code segments for use by at least one data processor (CPU 191) when implementing a routing protocol in a network. Refer to Column 10, lines 7-18. Furthermore, Matthews et al disclose sending information concerning a calculated connectivity metric (Zp(i)) to at least one other network node using a routing protocol packet (traversal value vector). "The node reports to the model what the metric values

are for the node and the arcs that originate from it". Refer to Column 6, lines 6-16. Refer also to the rejection of claim 1.

Matthews et al do not specifically disclose a first computer program code, a second computer program code, a third computer program code and a further computer code to perform the steps defined in claim 1.

However, Matthews et al disclose that the memory 192 "contains a computer program or data structure for providing to a general purpose computer instructions and data for carrying out the methods". Refer to Column 10, lines 14-18. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a first computer program code, a second computer program code and a third computer program code to perform the steps defined in claim 1, the motivation being that each step of the process requires a separate set of computer instructions.

Matthews et al also do not disclose that the computer program is used in a wireless network. Refer to the rejection of claim 1.

Referring to claim 21, Matthews et al disclose receiving information concerning a calculated connectivity metric ($Z_p(i)$) from at least one other network node. "As each node is discovered, a traversal value vector is recorded for that node", with the traversal vector including the current value for one of the metrics of the previous nodes in the discovered path. Refer to Column 6, lines 6-16.

Referring to claim 23, refer to the rejection of claim 1 and claim 11.

Referring to claim 24, refer to the rejection of claims 2 and 12.

Referring to claim 25, refer to the rejection of claims 3 and 13.

3. Claims 6, 7, 16, 17 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,084,858 to Matthews et al in view of U.S. Patent No. 6,535,498 to Larsson et al, and in further view of U.S. Publication No. 2003/0119538 to Momosaki et al.

Referring to claims 6 and 16, refer to the rejection of claim 1 and claim 11.

Furthermore, Matthews et al do not disclose that estimating includes considering a node's status and the number of the node's slaves.

Momosaki et al disclose estimating the amount of bandwidth needed in a system by determining the node's status (master or slave) and the number of the node's slaves. The total bandwidth is divided equally amongst the master and all the slaves. If the bandwidth required by each node increases, some slaves may have to be disconnected to order to accommodate the bandwidth requirement changes. Also, since the bandwidth is shared equally amongst all nodes, the number of slaves cannot increase, so the number of the node's slaves must be known to ensure that it does not go over the bandwidth threshold. Refer to Paragraphs 0075-0076. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that estimating includes considering a node's status and the number of the node's slaves; the motivation being to ensure that the total amount of bandwidth required by all the nodes does not exceed the total amount of bandwidth provided to the system, which must be shared equally amongst all nodes.

Referring to claims 7 and 17, Matthews et al do not disclose that considering a node's status considers whether a node is a Master node, a Slave node, or a Participant in Multiple Piconet (PMP) node.

Momosaki et al disclose considering whether a node is a master node or a slave node. The upstream device becomes a master and the downstream devices becomes slaves. Refer to Paragraphs 0075-0076. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that considering a node's status considers whether a node is a Master node, a Slave node, or a Participant in Multiple Piconet (PMP) node; the motivation being to determine the network topology and to determine the number of slaves and bandwidth required in the network, since the total bandwidth cannot exceed the network bandwidth.

Referring to claim 27, refer to the rejection of claim 1, claim 6 and claim 7.

4. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,084,858 to Matthews et al in view of U.S. Patent No. 6,535,498 to Larsson et al, and in further view of U.S. Publication No. 2003/0043746 to Hiroyuki et al.

Refer to the rejection of claim 1 and claim 11.

Furthermore, Matthews et al do not disclose inserting the value of the connectivity metric (bandwidth) into a routing protocol packet in place of the value of a hop number.

Hiroyuki et al disclose that finding an optimum path between nodes in a network comprises using a metric to compare paths. The metric can be the number of hops or the bandwidth, the goal of which is to minimize the metric in choosing a path. Refer to

Paragraph 0006 and 0051. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include inserting the value of the connectivity metric (bandwidth) into a routing protocol packet in place of the value of a hop number; the motivation being that bandwidth can also be used as a metric to determine the optimum path. By minimizing the bandwidth of one path, more bandwidth is available for other transmissions in the network.

Allowable Subject Matter

5. Claims 4, 5, 10, 14, 15 and 18 are allowed.

6. Claims 8, 20, 26 and 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments filed December 1, 2005 have been fully considered but they are not persuasive.

Referring to the argument of independent claims 1, 11 and 23 (page 12, line 15 to page 13, line 18): Matthews et al disclose that the best path is determined based upon each path's Metric Z value, which is based on transmission criteria "such as available bandwidth and a current usage count of the path" (Column 4, lines 44-48). Paths having higher bandwidth are preferred over paths having a lower bandwidth. Therefore, considering a path having a higher bandwidth reads on the claimed "maximum link bandwidth". Refer to Column 4, lines 50-57. If a path is chosen, the usage count of all links in the current path is incremented. The usage count of links is

used to determine the Metric Z value. Usage of a link is the current communication load on that link and the number of connections programmed/routed through that link; traffic will be routed through links with lower usage counts. Therefore, the usage count reads on the claimed "minimum traffic load". Refer to Column 4, lines 57-65 and Column 7, lines 27-37. A path is optimal if it has high bandwidth and low usage. Refer to Column 8, lines 15-19.

Referring to the argument of independent claims 6, 16 and 27 (page 13, line 21 to page 15, line 12): Momosaki et al disclose estimating the amount of bandwidth needed in a system by determining the node's status (master or slave) and the number of the node's slaves. The total bandwidth is divided equally amongst the master and all the slaves. If the bandwidth required by each node increases, some slaves may have to be disconnected to order to accommodate the bandwidth requirement changes. Also, since the bandwidth is shared equally amongst all nodes, the number of slaves cannot increase, so the number of the node's slaves must be known to ensure that it does not go over the bandwidth threshold. Refer to Paragraphs 0075-0076. Therefore, the number of slaves is needed in bandwidth estimation, since each slave requires a certain amount of bandwidth, and the total amount of bandwidth cannot exceed the available bandwidth for the communication system. The node's status (master or slave) is also needed in bandwidth estimation, since only slaves can be disconnected in order to accommodate bandwidth requirement changes; if slaves are disconnected, they free up more bandwidth for the other terminals, thereby affecting the bandwidth estimation.

Referring to the argument of independent claims 9 and 19 (page 15, line 13

to page 16, line 22): Hiroyuki suggests that in the Dijkstra method of determining a minimum metric between a source and destination node, the connectivity metric can be a number of hops, delay time, bandwidth, costs, etc. Since the connectivity metric can be other parameters besides the number of hops, this offers motivation for one to insert the value of the connectivity metric into a routing protocol packet in place of the value of a hop number, the connectively metric being other parameters such as delay time, bandwidth, costs, etc.

Applicant's arguments, see page 16, line 23 to page 18, line 5, filed December 1, 2005, with respect to claims 10 and 20 have been fully considered and are persuasive. The rejection of claims 10 and 20 has been withdrawn.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Ng whose telephone number is (571) 272-3124. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Ng CN
February 10, 2006

HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600